In the specification:

Kindly amend the specification as follows:

The amendments are made with reference to the published specification of Publication No. US 2007/0063060 A1 published on March 22, 2007.

(Page 5, paragraph beginning at line 19)

[0021] The present invention aims to provide a hydraulic control mechanism in a simple and compact mixing valve. The absence~~Devoid~~ of a mechanical link, via the sensing element, between a proportioning valve and a housing, results in a stable liquid outflow temperature despite variations in temperature or pressure of the hot and cold liquid supply. Making use of substantially the full operating flow to activate the valve mechanism, results in a valve mechanism that is not subject to failure consequent to the accumulation of solid material or solid particles and subsequent blockage of any narrow flow channels. The present invention also seeks to provide a mixing valve[,] which protects the user from total flow failure, most especially of the cold supply. Furthermore, the present invention requires no electrical power supply with attendant risks to the user.

(Page 6, paragraph beginning at line 9)

[0023] The mixing regulation assembly further comprises a stream divider, arranged in fluid flow communication with the second fluid outlet, operative to divide the mixed fluid stream into two component streams, each having rates of flow and pressures which are substantially equal to those of the other. Additionally, the mixing regulation assembly also comprises at least one flow controlling mechanism for increasing the flow of one of the component streams and decreasing the flow of the other component stream in concert, so as to induce a pressure differential between the two component streams; at least one thermally responsive element arranged to be in fluid flow and in heat transfer communication with at least one of the component streams and operative[,] to control the at least one flow controlling mechanism in response to a difference between the temperature of the component streams and the pre[-]selected temperature; and also ~~comprises~~ a recombination and discharge means for recombining the component streams into a mixed fluid stream for output from the fluid mixing valve via the first fluid outlet.

(Page 8, paragraph beginning at line 19)

[0049] Additionally, in another embodiment of the present invention, the at least one thermally responsive element ~~elements~~ is selected from the group of: bimetal elements; thermally expandable elements, wax-operated thermostats, and fluid-operable elements.

(Page 8, paragraph beginning at line 22)

[0050] According to a variation of an embodiment of the present invention, the bimetal element ~~elements~~ is ~~are~~ configured as one of the elements selected from the group of: disc, coil and rod.

(Page 12, paragraph beginning at line 7)

[0095] The present invention seeks to provide a solution to the problem of providing a constant, stable temperature from separate supplies of hot and cold water or other fluids in various environments, including but not limited to~~, for example in~~ industry, hospitals, sports clubs, hotels[,] and homes, including end point uses such as basins and showers. While this is not an insuperable problem, a successful solution must provide a device, which is simple to install, requires no electrical power for reasons of safety, is compact, and protects the user from the danger of exposure to scalding hot water or the discomfort of cold water. Furthermore, the output temperature must remain stable at a pre-selected level in spite of fluctuations in both temperature and pressure of either of the supplies of hot and cold water consequent to load changes in the supply lines. The most problematic scenario to be avoided relates to a substantially total supply failure of cold water, potentially exposing the user to essentially undiluted hot water. In addition, there is a need for a selectively disengageable stop mechanism, which limits a maximum hot water setting. Most especially, the device must not be excessively costly or complex.

(Page 13, paragraph beginning at line 15)

[0099] The incoming hot and cold water streams[,] entering through valves 8 and 9 are mixed in a mixing chamber 15, in which the temperature is Tm and the pressure is Pm. Under

normal operating conditions, Pm will be lower than the lower of Pc or Ph, and Tm will lie between Tc and Th. Furthermore, pressure Po is lower than Pm.

(Page 13, paragraph beginning at line 19)

[0100] The main mixed water stream is divided into two substantially equal component streams by passing the mixed water stream through flow divider 11 such as two substantially similar fixed restrictors. Thereafter, the two component streams activate a temperature-sensing element 2, which reacts to changes in temperature Tm. The two component streams pass through a further pair of adjustable mechanically coupled divided stream valves 12 and 13 which, at their mid-position, permit flow substantially similar to that passing through flow divider 11~~-such as restrictors~~, and which make adjusting movements, the extent of which are represented by Y+ and Y–. The signs (+) and (–) represent a substantially identical flow-adjusting movement of valves 12 and 13 but in opposite directions. The position of coupled valves 12 and 13 is adjusted by sensing element 2, thereby providing a pressure differential dPm between the two component streams. This pressure differential operationally activates hot and cold inlet valves 8 and 9. The requisite flow of mixed water is controlled by an outlet valve 14.

(Page 14, paragraph beginning at line 12)

[0102] Referring now to FIG. 2 there is seen a schematic flow diagram indicating the operation of a mixing valve system 20, in accordance with another preferred embodiment of the present invention. Unlike as seen in FIG. 1, a temperature-sensing element 2, associated with divided stream valves 12 and 13, is disposed in the divided flow component streams 3 and 4 emanating from mixing chamber 15, and restrictors-type flow divider 11, are disposed in each stream prior to re-combining the two component streams 3 and 4 into outlet valve 14. A change in temperature Tm sensed by sensor 2 causes a pressure differential dPm, which provides a change in setting of inlet valves 8 and 9. ~~Restrictors flow divider~~ Flow divider 11 may be adjustable in order to enable presetting of a selected outlet temperature Tm.

(Page 15, paragraph beginning at line 15)

[0105] Referring now to FIGS. 8 and 9 in conjunction with FIGS. 4-7, in accordance with an embodiment of the present invention, there is seen a cross-sectional view (FIG. 8) taken along line 3-3 (FIG. 9) of an end view of a mixing valve assembly 60, constructed and operative in accordance with the present preferred embodiment of the present invention. Mixing valve assembly 60 includes a housing 61 with a closure 63 fixably screwed thereto. Closure 63 has a cold water inlet 65 formed coaxially therein including a threaded connection for attaching piping (not shown) to inlet 65. Housing 61 is formed having a coaxial hot water inlet 67 and a mixed water outlet 69 formed radially therein. Spool assembly 30 (as disclosed hereinabove in relation to FIGS. 3-7) is disposed within housing 61, and elastically attached thereto, by means of two substantially similar elastic diaphragms 71 and 72, semi-elastic seals 73, o-rings 75, clips 77, a spacer ring 79, and an exit ring 81. Exit ring 81 has a plurality of orifices 82 formed therein to provide fluid flow therethrough. Spool 31 is slidingly supported at both extremities by seals 73. Any difference in pressure between pressure chambers 95 and 97, formed respectively between diaphragm ~~diaphragms~~ 71 and housing 61 and between diaphragm 72 and closure 63, will result in an axial sliding movement of spool 31 through seals 73. At the extremity of such movements, either end of spool 31 closes against valve seats 91.

(Page 16, paragraph beginning at line 2)

[0106] Hot and cold water enters through inlet ports 67 and 65 through openings 93 around the valve <u>seats</u> ~~seat~~ 91 into valve spaces 83 and 85 respectively, and thereafter enters mixing chamber 32. The water pressure in chamber 32 acts substantially equally in both directions, such that the spool 31, having internal conical ends in order to minimize the contact area with seats 91, is not influenced by pressure differences between hot and cold supply pressures.

(Page 16, paragraph beginning at line 12)

[0108] Assuming now, by way of a non-limiting example, that the cold water pressure Pc temporarily falls. The mixed water stream temperature Tm rises and bimetal disc 50 reacts as seen in ~~Figures~~ <u>FIG.</u> 6, and ~~in~~ FIG. 7, which illustrates detail "B" (FIG. 6). Since the external diameter of bimetal disc 50 is slightly smaller than the external diameter of recess 44, the circumference of disk 50 will distort, entering into recess 44 of disc 38, effectively reducing

or blocking the flow of water from recess 44 and simultaneously allowing an increased flow from recess 45. Apertures 34 and 43 [,]and recess 35 (FIG. 3) provide fluid flow communication between each of recesses 44 and 45 and pressure chambers 45 and 97 respectively. Apertures 34 and 43 provide pressure equalizing connections, respectively, between chambers 44 and 95, and chambers 45 and 97 and are sized to provide the spool an oscillation damping effect.

(Page 16, paragraph beginning at line 30)

[0109] When the bimetal disc 50 is planar there is no longer a pressure differential to alter the position of assembly 30 and new equilibrium conditions are obtained ~~obtain~~, with spool assembly 30 taking up a new equilibrium position at the pre-selected temperature. It is for this reason that the mixing valve control mechanism is not a directly driven proportional control, but a true servo-feedback mechanism, thus avoiding either cycling operation or an equilibrium temperature differing from the pre-selected temperature Tm.

(Page 23, paragraph beginning at line 3)

[0130] The clogging problems common in many other thermostatic servo-controlled mixing valves have been eliminated by removal of any relatively lengthy and narrow flow passages. In prior art mixing valves where a small sample flow through a relatively narrow passage is utilized to provide thermal control, the possibility of a blockage is manifestly high and the response is slow. Dividing the full mixed water flow into two substantially equal component streams through the spool assembly 220 provides a turbulent flow resulting in a rapid[,] and sensitive response by the one or more bimetal discs, thus eliminating the possibility of blockage evident in other types of mixing valves.

(Page 26, paragraph beginning at line 11)

[0141] Due to the decrease in water volume of the spool assembly, water temperature is measured by the bimetal disk in a very short time after passing the hot and cold water inlet valves. Bimetal response to any change in mixed water temperature is faster than the mechanical oscillation cycle time related to that flow condition, and ~~conditions~~ feedback phase delay tending to cause excessive response

(overshoot) is shorter and effectively prevented ~~dumped by the water volume~~ in spaces 295, 297 (FIG. 11), [.] as ~~The~~ the water trapped in these spaces is able to escape only through dumping holes 243.

(Page 26, paragraph beginning at line 18)

[0142] Also, heat transfer from the water to the bimetal disk is faster due to faster flow rate along the disk surface.

(Page 26, paragraph beginning at line 24)

[0143] Referring now to FIG. 21 there is illustrated, in accordance with a further preferred embodiment of the present invention, a cross-section view of a spool assembly 620, partially based on the spool assembly shown in FIG. 11. Openings 633 in spool pipe 631 serve as inlets to the mixing chamber 632. An externally and internally threaded nut 633 locks the assembly of spring disks ~~238,239~~ 238, 239, spacer rings 240, bimetal disk 250 and ring 256. Operation of the assembly is described in detail in relation to FIG. 11.

(Page 26, paragraph beginning at line 26)

[0144] Referring now to FIGS. 22 and[,] 23 in conjunction with FIG. 21, there is seen a cross-sectional view (FIG. 22) taken along line 10-10 of an end view (FIG. 23) of a mixing valve 660. ~~spool~~Spool assembly 620 (as disclosed hereinabove in relation to FIG. 21) ~~which~~ is disposed within housing 661 and housing closure 663.[,] ~~spool assembly 620 (as disclosed hereinabove in relation to Figure 21).~~

(Page 27, paragraph beginning at line 2)

[0145] Here a spring-loaded bypass 671 located within closure 663 is configured to allow water flow through the bypass when pressure drop across the valve is higher than a certain preselected pressure.

(Page 27, paragraph beginning at line 7)

[0147] As long as the pressure drop between mixing chamber 632 and the outlet port 669 is lower than a certain ~~pre-selected~~ preselected value the disk 675 is pushed by spring 673 towards its seat in sleeve 686 and water can flow only through openings 237 of the spool assembly 620 on both sides of the bimetal disk 250 through gaps 246, 247 holes 255, 281 to the exit port 669.

(Page 27, paragraph beginning at line 11)

[0148] If higher flow rates are desired, the pressure drop between mixing chamber 632 and outlet port 669 will increase such that the bypass disk 675 will force back spring 673 and allow flow of mixed water through bypass 671. This embodiment of the present invention uses the spool assembly at a narrow flow margin to achieve more accurate temperature control, yet when there is demand for high flow rates, increase in flow is directed through the bypass 671, this will not affect ~~effect~~ the accurate mixing to the pre-selected temperature performed at the end of the spool pipe 631 opposite to the bypass 671. The spool pipe 631 is open on both sides to eliminate influence of inlet water pressure on spool position.

(Page 27, paragraph beginning at line 23)

[0150] Referring now to FIGS. 24-25, in accordance with a further preferred embodiment of the present invention, there is seen a ~~cross-section~~ cross-sectional view (FIG. 24) taken along line 12-12 of an end view (FIG. 25) and a partially sectioned end view (FIG. 25) taken along line 11-11 of FIG. 24. Both ~~describing~~ describe a mixing valve 560, which is disposed within a housing 561 and housing closure 563, spool assembly 130 (as disclosed hereinabove in relation to FIG. 10) and diaphragm 171 (as disclosed herein above in relation to FIG. 12).

(Page 27, paragraph beginning at line 29)

[0151] The suggested embodiment is based on the mixing valve 160 as described in relation to FIGS. 12, 13. ~~12,13~~

(Page 28, paragraph beginning at line 1)

[0152] Here vane wheels 501 and [,]503, disposed on a common shaft axis 502, and hence rotating at the same speed, force the same volumetric output through both sides of the central diaphragm 171. In FIG. 24, a separator, such as ring 505 in a preferred embodiment of the invention, maintains fluid separation between the two component streams. To facilitate assembly, the bottom portion of housing 561[,] is closed with a threaded plug 507, which centers and hold the exposed shaft defined by axis 502 of vane wheels 501, 503.

(Page 28, paragraph beginning at line 7)

[0153] In this embodiment of the present invention, vane wheels 501 and[,] 503 comprise the flow divider replacing the orifices 189 and[,] 190 described in conjunction with FIG. 12, and the fixed equal ~~restrictors~~ restrictor type flow divider 11 in the method of FIG. 2. Replacing the fixed ~~restrictors~~ restrictor type flow divider 11 with an active vane flow divider greatly increases the margin of flow rate while temperature accuracy is strictly maintained. It should be noted that the volume of fluid filling the chamber defined by the vane wheels 501 and[,] 503 serves, even with the absence of the vane wheel itself, as a regulating chamber, averaging the temperature of the water volume captured inside. A circular flow path such as is defined in FIG. 25 has good temperature averaging capability, even without the vane itself. A greater volume of fluid and therefore better regulation is easily accommodated simply by use of a larger capacity chamber.